

## PATENT ABSTRACTS OF JAPAN

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### (54) PORTABLE INFORMATION EQUIPMENT

#### (57)Abstract:

PROBLEM TO BE SOLVED: To provide a portable information equipment in which self-diagnosis of a certain high degree can be executed on the condition of health.  
 SOLUTION: A portable telephone set 21 is provided with a sensor part 23 in which a blood pressure, a blood pulse and a body temperature or the like can be measured. The measurement of them is started by operating an operating part 25 and while referring to a diagnostic table stored in a diagnosis part 33, not only measured values but also the diagnosed result are displayed on a display 24. Corresponding to the operated content of the operating part 25 by using information stored in a sending sound storage part 36, the diagnosed result can also be outputted from a speaker 26 in voice. Data measured in the past are stored in a diagnosed result storage part 34 and can be called as needed.

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### CLAIMS

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#### [Claim(s)]

[Claim 1] Portable information machines and equipment comprising:

A measuring instrument which measures two or more predetermined health check items where some a possessor's bodies are contacted.

A table for medical examinations showing a relation of combination of each measured value of two or more health check items and health condition which this measuring instrument measures.

A collation means which compares at least a part of measurement result of said measuring instrument with this table for medical examinations.

A health examination result output means which outputs a health examination

result as a collated result of this collation means.

[Claim 2] Portable information machines and equipment comprising:

A measuring instrument which measures two or more predetermined health check items where some a possessor's bodies are contacted.

A table for medical examinations showing a relation of combination of each measured value of two or more health check items and health condition which this measuring instrument measures.

A measurement result memory measure which memorizes a measurement result of said measuring instrument with clock information at the measurement time.

A collation means which compares with this table for medical examinations at least a part of measurement result of the past memorized by a present measurement result and a measurement result memory measure of said measuring instrument and a health examination result output means which outputs a health examination result which considered a temporal change as a collated result of this collation means.

[Claim 3] The portable information machines and equipment according to claim 1 or 2 wherein said health examination result output means is a display.

[Claim 4] The portable information machines and equipment according to claim 1 or 2 wherein said health examination result output means is a loudspeaker.

[Claim 5] The portable information machines and equipment according to claim 1 or 2 wherein said health examination result output means are a text conversion method which changes a health examination result into a fixed form text and an E-mail delivery means which sends out a changed text to a partner specific as an E-mail.

[Claim 6] It has a personal-data memory measure which memorizes personal data such as a possessor's age. The portable information machines and equipment according to claim 1 or 2 wherein it compares said collation means with the contents of said table for medical examinations using personal data memorized by personal-data memory measure and said health examination result output means outputs a health examination result.

[Claim 7] The portable information machines and equipment according to claim 1 or 2 wherein said two or more predetermined health check items are two or more arbitrary items of blood pressure, a pulse, body temperature, an electrocardiogram, and the blood flows.

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to portable information machines and equipment with carrying [ much ] easily especially with respect to portable

information machines and equipment.

[0002]

[Description of the Prior Art] Change of such industrial structure or business is for various industries to use computers and the Internet and to induce much stress in recent years. Concern about health is increasing in order to make it adapted for change of such a time. The measure which receives healthily is taken in each fieldsuch as environment of foodstuffs, a sports residence or a place of work and Medical Science Division so that it may be in sympathy with this. The importance of grasping change of one's health condition under such a situation in response to the fact that [ medical examination ] periodically is also recognized widely. The point of giving an opportunity to improve a daily life cannot but take remarkable time and expense to it although the regular health check by a medical practitioner is very effective and as it was called once a year it cannot but keep a certain amount of interval in many cases. There are also much those who cannot continue and receive a regular health check without [ time ] it being convenient.

[0003] Then in a form which complements the regular health check by a medical practitioner many medical devices for checking health easily by oneself are put on the market and generally it has spread. For example in JPH11-206721A each measuring means of blood pressure, a pulse and body temperature was built in the wrist watch, these measurement was performed periodically and if a comparison result is an abnormal condition as compared with a reference value, the art of which it warns at a display for indication or a buzzer will be proposed. JPH05-052975A also arranges the pulse sensor and the temperature sensor in the band of the wrist watch and if the full limits set up beforehand are exceeded, he is trying to supervise a pulse and body temperature by these and to emit an alarm.

[0004] Since the very small cell is used in the medical device which uses such a wrist watch where power consumption is reduced as much as possible, various kinds of measurement is performed. For this reason, since the area of the indicator which it is not only difficult to take high measuring accuracy but it includes in a clock was small, display information also had to be simplified dramatically. Then using the portable telephone as apparatus more large-sized than a wrist watch as medical equipment attracts attention.

[0005] Drawing 7 shows the contents of a proposal by the utility model registration No. 3069978. In this proposal, the measuring instrument 12 which can send the signal which contacted the skin surface 11 of the human body and was measured is connected to the portable telephone 15 via the cable 13 and the connector 14 for signal transduction. The portable telephone 15 receives measurement data such as a pulse as a measurement result. When the value made the comparator which is not illustrated is arranged inside the portable telephone 15 and healthy [ a measurement result ] as compared with a reference value is exceeded greatly, while the control circuit which similarly is not illustrated carries out singing of the buzzer and emits a short warning, a measurement-size value is displayed on the display 16 and the cautions to the health condition of the body are demanded from a user.

[0006]

[Problem(s) to be Solved by the Invention]In the proposal shown in this drawing 7 it measures by connecting the measuring instrument 12 to the portable telephone 15. Therefore the measuring instrument 12 needed to be carried at the place which measures and there was a problem that a measuring place was limited to a home or a place of work as a matter of fact. That is although there was an advantage which uses always carried portable information machines and equipment which are called a portable telephone it was equivalent to it in order to use the bigger measuring instrument 12 than it it was not able to be said that it measured freely in the middle of a business trip destination or shopping etc.

[0007]By this proposal singing of the buzzer is carried out at the time of abnormalities or a measurement-size value is only displayed on the display 16 and it did not change fundamentally with the art used with the wrist watch shown previously but the accuracy of the measurement result was only raised only using the measuring instrument 12.

[0008]Then the purpose of this invention is to provide the portable information machines and equipment which can carry out the self-test of the health condition somewhat highly.

[0009]

[Means for Solving the Problem]A measuring instrument which measures two or more predetermined health check items in the invention according to claim 1 where some a (b) possessor's bodies are contacted(\*\*) A table for medical examinations showing a relation of combination of each measured value of two or more health check items and health condition which this measuring instrument measures(\*\*) a collation means which compares at least a part of measurement result of a measuring instrument with this table for medical examinations and (\*\*) – make portable information machines and equipment possess a health examination result output means which outputs a health examination result as a collated result of this collation means

[0010]Namely a measuring instrument which measures two or more predetermined health check items to portable information machines and equipment in the invention according to claim 1 where some a possessor's bodies are contacted He arranges a table for medical examinations showing a relation of combination of each measured value of two or more health check items and health condition which this measuring instrument measures and is trying to output a health examination result as a result of having compared a measurement result of a measuring instrument with this table for medical examinations. Thus since a medical examination is performed from a measurement result of two or more health check items using the portable information machines and equipment themselves with which it walks around simply a to some extent advanced medical examination can be simply performed without a doctor's intervention.

[0011]A measuring instrument which measures two or more predetermined health check items in the invention according to claim 2 where some a (b) possessor's bodies are contacted(\*\*) A table for medical examinations showing a relation of

combination of each measured value of two or more health check items and health condition which this measuring instrument measures(\*\*) A measurement result memory measure which memorizes a measurement result of a measuring instrument with clock information at the measurement time(\*\*) A collation means which compares with this table for medical examinations at least a part of measurement result of the past memorized by a present measurement result and a measurement result memory measure of a measuring instrument(\*\*) Make portable information machines and equipment possess a health examination result output means which outputs a health examination result which considered a temporal change as a collated result of this collation means.

[0012]Namely a measuring instrument which measures two or more predetermined health check items to portable information machines and equipment in the invention according to claim 2 where some a possessor's bodies are contactedA table for medical examinations showing a relation of combination of each measured value of two or more health check items and health condition which this measuring instrument measures is arrangedHe compares with a table for medical examinations using the present measurement result of a measuring instrumentand the past measurement resultand is trying to output a health examination result as the result. Thussince a medical examination is performed using the portable information machines and equipment themselves with which it walks around simply from a measurement result of two or more health check itemsand the past measurement resulta to some extent advanced medical examination can be simply performed without a doctor's intervention.

[0013]In the invention according to claim 3it is characterized by a health examination result output means being a display with the portable information machines and equipment according to claim 1 or 2.

[0014]That isin the invention according to claim 3a health examination result output means is a displayand since a result is outputted by a visual displaying meansa graphical display can not only be attainedbut it can check a result of a medical examination under environment which does not output a sound easily.

[0015]In the invention according to claim 4it is characterized by a health examination result output means being a loudspeaker with the portable information machines and equipment according to claim 1 or 2.

[0016]That isin the invention according to claim 4a diagnostic result is outputted with a sound. Thereforemore information can be transmitted compared with a case where it displays on a display using a character etc. Transfer of information is attained also under environment where it is hard to check information which a display displays.

[0017]In the invention according to claim 5it is characterized by health examination result output means being a text conversion method which changes a health examination result into a fixed form textand an E-mail delivery means which sends out a changed text to a partner specific as an E-mail with the portable information machines and equipment according to claim 1 or 2.

[0018]That isin the invention according to claim 5like a case where it outputs with

a sound measurement result etc. are transposed to a text and if it transmits to an address which defined this beforehand as an E-mail it will become possible to keep a measurement result certainly or to print. When required it is also possible to send out data to a medical institution.

[0019] In the invention according to claim 6 with the portable information machines and equipment according to claim 1 or 2. It has a personal-data memory measure which memorizes personal data such as a possessor's age a collation means is compared with the contents of the table for medical examinations using personal data memorized by personal-data memory measure and it is characterized by a health examination result output means outputting a health examination result.

[0020] Namely in the invention according to claim 6 portable information machines and equipments such as a portable telephone are that many register the possessor's personal data beforehand in view of a fact that an individual possesses A more concrete health examination result can be outputted now combining the data and data obtained by measurement.

[0021] In the invention according to claim 7 two or more predetermined health check items described above with the portable information machines and equipment according to claim 1 or 2 are characterized by being two or more arbitrary items of blood pressure a pulse body temperature an electrocardiogram and the blood flows.

[0022] That is the invention according to claim 7 shows measuring two or more arbitrary items of blood pressure a pulse body temperature an electrocardiogram and the blood flows as an example and checking health. However it is necessary to prepare an electrode measured in a position measured with portable information machines and equipment and a position which separated in measurement of data used for an electrocardiogram and to connect via a cable which does not illustrate this electrode to portable information machines and equipment.

[0023]

[Embodiment of the Invention]

[0024]

[Example] This invention is explained in detail per working example below.

[0025] Drawing 1 expresses the appearance of the portable telephone as portable information machines and equipment in one working example of this invention. This portable telephone 21 is the same as the usual portable telephone if the point that the sensor part 23 is arranged at the flank 22A of the telephone set body 22 is removed. By contacting a possessor's finger the sensor part 23 has structure which can measure blood pressure a pulse and body temperature. This sensor part 23 performs detecting operation by operating the predetermined key switch which constitutes the final controlling element 25 arranged at the display 24 bottom of the telephone set body 22. Depending on a portable telephone sensor part 23 the very thing is constituted from a switch of a push type and detecting operation is performed where this is pushed in with a finger. The loudspeaker 26 is arranged at the display 24 upper part. Also when the loudspeaker 26 is not only used for the telephone call for a telephone but outputs the result of a medical examination with

a sound if needed it is used.

[0026] Drawing 2 expresses the outline of the circuitry of the portable telephone of this example. The portable telephone 21 contains the control section 31 provided with CPU (central processing unit) which is not illustrated ROM (read only memory) which stored the control program and RAM (random access memory) as an operation memory. The control section 31 is connected with each part in a device via the bus which is not illustrated or the circuit for input and output. among these the thing which the final controlling element 25 comprises many key switches as drawing 1 showed but is operated independently combining these suitably -- the [ the 1st for a medical examination - ] -- contents of operation 32<sub>1</sub> of N - 32<sub>N</sub> can be realized now.

[0027] The sensor part 23 is a portion which can measure blood pressure a pulse and body temperature as described above and it is provided with the element which performs each measurement. Among these blood pressure can constitute a small finger type sphygmomanometer from using the small pressure sensor of a semiconductor type for example. A pulse can constitute the finger type pulsometer combining a light emitting device and a photo detector. A blood flow meter is also realizable by this equipment configuration. The usual temperature detector can be used about a thermometer. The diagnostic part 33 stores the personal data about the health of the possessor of a diagnostic table or the portable telephone 21 required for diagnosis who does not illustrate. Here personal data are information which is useful when performing a medical examination based on measurement like the body temperature made into age (date of birth) sex and normal temperature. Although the diagnostic part 33 may do medical examination work in this example the control program stored in CPU and ROM of the control section 31 plays the role.

[0028] Drawing 3 expresses the outline of a diagnostic table. Each diagnosis detail 43 is stored in the diagnostic table 41 as text information in the form where each item of age sex blood pressure a pulse and body temperature made it correspond to the address information 42 which is an address and which constituted the part respectively. The diagnosis detail serves as a form which made a text sentences such as "it is normal body temperature" being "feverish" blood pressure is "normal" blood pressure being slightly high consult with a medical practitioner since blood pressure is high and "a pulse being normal within the limits" correspond to each measurement result and combined it.

[0029] The diagnostic result storage parts store 34 is a memory which stores the past diagnosis with clock information such as those performed time. The display 24 performs the usual display action when using it as a portable telephone and also displays what called the diagnostic result of the past memorized by the diagnostic result storage parts store 34. The result of the medical examination which the diagnostic part 33 and the control section 31 performed is displayed as test information. When the contents which diagnose by referring to not only the present measurement result but the past history on the diagnostic table 41 are stored the more advanced diagnostic result by this will be displayed on the display

24. For example the body temperature at each [ of 1 hour ago etc. ] time is compared with the present body temperature and "body temperature's rising" and the diagnosis detail "it fell to normal temperature and 2 hours passed" can be displayed on the display 24. Display information may not be restricted to text information and may combine a graph and image information depending on a device. In this example the graph which shows change of the body temperature for every time will be shown.

[0030] The sending-out sound storage parts store 36 comprises an amplifier which amplifies the voice data outputted from the voice circuit and voice circuit which memorized the fixed form words and phrases as a diagnosis detail as a sound and which are not illustrated. The loudspeaker 26 will output the audio signal of an amplifier.

[0031] Drawing 4 expresses the outline of the processing operation of this portable telephone. CPU in the control section 31 shown in drawing 2 is supervising whether 1st contents of operation 32<sub>1</sub> in the final controlling element 25 is operated (Step S51). If the possessor of \*\*\*\*\* 21 operates this it will be set as (Y) and health-care mode (Step S52). The usual operational mode as (Step S51:N) and a cellular phone will be performed at cases other than this (Step S53).

[0032] Drawing 5 and drawing 6 express the concrete contents in the health-care mode shown at Step S52 of drawing 4. If set as health-care mode the above mentioned CPU will supervise whether 2nd contents of operation 32<sub>2</sub> or 4th contents of operation 32<sub>4</sub> shown in drawing 2 by the time predetermined time t<sub>1</sub> passed is directed (Steps S61-S63). Health-care mode is ended noting that the selection in the health-care mode explained by (Step S63:Y) and drawing 4 itself is an error when time t<sub>1</sub> passes in the state where these neither is operated (end).

[0033] When 2nd contents of operation 32<sub>2</sub> shown in drawing 2 on the other hand by the time time t<sub>1</sub> passed is operated the sensor part 23 shown in (Step S61:Y) drawing 1 etc. is used and measurement of blood pressure a pulse and body temperature is performed (Step S64). An end of measurement will create a diagnostic result using the diagnostic table 41 shown in drawing 3 (Step S66). (step S65:Y) And supposing it is 36 \*\* near Hiraatsu whom the age of the possessor of the portable telephone 21 registered into the male at the age of 45 blood pressure registered into "70" in the maximum "120" the lowest blood pressure "80" and a pulse and body temperature registered into beforehand [ of the person himself/herself ] for example The display "the maximum "120" the lowest blood pressure "80" and a pulse are 36 \*\* and the blood pressures of today's your diagnostic result are [ "70" and body temperature ] both normal values" will be performed on the display 24 (drawing 1) (Step S67).

[0034] When a possessor operates 3rd contents of operation 32<sub>3</sub> shown in drawing 2 in this stage (step S68:Y) the contents displayed on the display 24 will be outputted outside using the loudspeaker 26 (Step S69). At this time the sound showing the finite text memorized by the sending-out sound storage parts store 36 or a numerical value will be put together and outputted. At this time the words and phrases corresponding to this which was memorized by the sending-out sound



storage parts store 36 are outputted with a sound to the measurement result which shows the unusual value. The case where maximal blood pressure is a value lower than normal values like "95" "maximal blood pressure is low. The voice message consult with a doctor when accompanied by conditions such as lightheadedness a dull headache and tinnitus is added to measured value, and is outputted. Thereby, the possessor of the portable telephone 21 is at a stage in which a certain abnormalities began to appear, and can take suitable correspondence. [0035] Thus, if a diagnostic result is outputted with a sound, it not only can obtain a diagnostic result, but it can acquire detailed information in the form of a voice message, without seeing a display also at a dark place or the place which was [ each other ] crowded. Such a detailed diagnosis detail or advice can also take how to print and keep it, when the text information is transmitted by E-mail and it returns to a house. What is necessary is to transpose these to a text and just to transmit to the address defined beforehand, in transmitting a measurement result and a diagnostic result by E-mail. If it is under going to hospital regularly, it is also possible to send out data to the medical practitioner.

[0036] Without operating 3rd contents of operation 32<sub>3</sub> shown in Step S68, when a possessor points to the end in the mode, (Step S70:Y) and health-care mode are completed (end). In this case, as shown in drawing 4 it shifts to cellular-phone operational mode (Step S53). Even if the portable telephone 21 of this example is in health-care mode it is possible for the mail arrival itself and after shifting to cellular-phone operational mode it can also be talked over the telephone.

[0037] By the way when the possessor of the portable telephone 21 points to 4th contents of operation 32<sub>4</sub> it shifts to the processing shown in (Step S62:Y) and drawing 6. Namely CPU reads the memory content of the diagnostic result storage parts store 34 shown in drawing 2 and displays it on the display 24 by making the list of the past diagnosis detail into a diagnosis list (Step S71). If a possessor chooses desired time or health check item seeing this display information (step S72:Y) the diagnostic result to that selected health check item will be displayed on the display 24 (Step S73).

[0038] In order for a possessor to operate 3rd contents of operation 32<sub>3</sub> by this displaying condition to end health-care mode or (Step S75) to see other diagnostic results from the list of the past diagnosis detail processing can be returned to Step S71 (Step S76). When 3rd contents of operation 32<sub>3</sub> is operated the output of the sound to the past diagnostic result is performed like processing by (Step S74:Y) and previous Step S69 (Step S77). Then a possessor becomes what the directions which perform selection for returning processing to Step S71 or (step S78:Y) end health-care mode are performed for (step S79:Y).

[0039] Deformable nature of an invention [0040] Although the health of the possessor of a portable telephone was diagnosed using the present measurement result in working example described above the past measurement result and the present measurement result are tested by comparison and it may be made to perform a medical examination. In this case what is necessary is to read applicable contents and just to make it output as a diagnostic result from the table in which

the diagnosis detail which considered change of the blood pressure and the pulse to now from the past body temperature was described.

[0041] Although the medical examination was performed based on blood pressure and pulse and body temperature in working example, other items such as a blood flow and an electrocardiogram may be combined or arbitrary plurality is chosen out of these and it may be made to perform a medical examination from those measurement results. Thus if the item of a medical examination tends to increase, personal information tends to be complicated or it is going to refer to the past measurement result, the table which the data used for diagnosis increased in number and was shown in working example may become complicated. In such a case, it may be made to acquire the data for table construction of the part needed by a relation with a possessor's personal information from networks such as the Internet. It is not necessary to provide by this the general-purpose table applied to anyone in a portable telephone and there is an advantage that the capacity of a memory is mitigable.

[0042] Although working example explained taking the case of the portable telephone PHS (Personal Handyphone System), Naturally this invention is applicable to all the small portable information machines and equipment useful for carrying of PDA (Personal Data Assistance Personal Digital Assistants) etc.

[0043] Although the past measurement result was memorized and it decided to read the value or to diagnose to these values in working example, the diagnostic result at each time is memorized and it may enable it to read these simply.

[0044]

[Effect of the Invention] Since a medical examination is performed based on the measurement result of two or more health check items using the portable information machines and equipment themselves with which it walks around simply according to the invention according to claim 1 to 7 as explained above, to some extent advanced medical examination can be simply performed without a doctor's intervention. Therefore, health can be checked to a sudden accident etc. and exact information can be reported to a medical practitioner.

[0045] According to the invention according to claim 2, since a medical examination is performed using the measurement result of two or more health check items and the past measurement result using the portable information machines and equipment themselves with which it walks around simply, to some extent advanced medical examination which considered a temporal change can be simply performed without a doctor's intervention.

[0046] According to the invention according to claim 3, a health examination result output means is a display and since a result is outputted by a visual displaying means, a graphical display can not only be attained but it can check the result of a medical examination under the environment which does not output a sound easily.

[0047] Since a diagnostic result is outputted with a sound according to the invention according to claim 4, more information can be transmitted compared with the case where it displays on a display using a character etc. Transfer of information is attained also under the environment where it is hard to check the

information which a display displays.

[0048]According to the invention according to claim 5a measurement result etc. are transposed to a text and since it transmits to the address which defined this beforehand as an E-mail it becomes possible to keep a measurement result certainly or to print. In being required it sends out data to a medical institution and the technique of receiving correspondence by E-mail also becomes possible.

[0049]According to the invention according to claim 6 portable information machines and equipments such as a portable telephone are that many register the possessor's personal data beforehand in view of the fact that the individual possesses. It becomes possible to output a more concrete health examination result combining the data and the data obtained by measurement.

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is a perspective view showing the appearance of the portable telephone as portable information machines and equipment in one working example of this invention.

[Drawing 2] It is a block diagram showing the outline of the circuitry of the portable telephone of this example.

[Drawing 3] It is an explanatory view showing the outline of the diagnostic table of this example.

[Drawing 4] It is a flow chart showing the outline of the processing operation of a portable telephone.

[Drawing 5] It is a flow chart showing the concrete contents in the health-care mode shown at Step S52 of drawing 4.

[Drawing 6] It is a flow chart showing the concrete contents in the health-care mode shown at Step S52 of drawing 4.

[Drawing 7] It is an explanatory view showing the composition of the apparatus for medical examinations by which the conventional proposal was made.

[Description of Notations]

21 Portable telephone

23 Sensor part

24 Display

25 Final controlling element

26 Loudspeaker

31 Control section

32 The contents of operation

33 Diagnostic part

34 Diagnostic result storage parts store

36 Sending-out sound storage parts store

41 Diagnostic table